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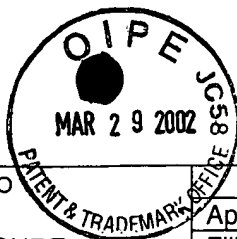
Substitute for form 1449A-B/PTO  INFORMATION DISCLOSURE STATEMENT BY APPLICANT  (use as many sheets as necessary)	Complete if Known	
	Application Number	09/247,886
	Filing Date	February 10, 1999
	First Named Inventor	Juha Punnonen
	Group Art Unit	1633
	Examiner Name	S. Chen
	Attorney Docket Number	02-030210US
Date Submitted	March 25, 2002	

U.S. PATENT DOCUMENTS						
Examiner Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code (if known)			
	1	5,252,714		Harris et al.	10-12-1993	
	2	5,348,867		Georgiou et al.	09-20-1994	
	3	5,512,463		Georgiou et al.	09-20-1994	
	4	5,514,588		Varadaraj	05-07-1996	
	5	5,571,698		Ladner et al.	11-05-1996	
	6	5,691,170		Gritz et al.	11-25-1997	
	7	5,763,239		Short et al.	06-09-1998	
	8	5,789,228		Lam et al.	08-04-1998	
	9	5,814,473		Warren et al.	09-29-1998	
	10	5,862,514		Kauffman et al.	10-20-1998	
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	13	5,882,883		Egel-Mitani et al.	03-16-1999	
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	18	5,958,751		Murphy, et al.	09-28-1999	
	19	5,962,258		Mathur, et al.	10-05-1999	
	20	5,962,283		Warren et al.	10-05-1999	
	21	5,985,285		Titball et al.	11-16-1999	
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	23	6,043,030		Beach et al.	03-28-2000	

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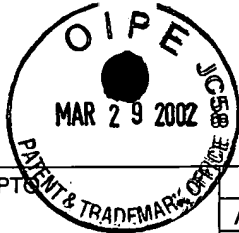
	24	6,054,312		Lacocca et al.	04-25-2000	
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	28	6,159,687		Vind	12-12-2000	
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	32	6,168,919		Short	01-02-2001	
	33	6,171,820		Short	01-09-2001	
	34	6,174,673		Short et al.	01-16-2001	
	35	6,177,263		Arnold et al.	01-23-2001	
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	37	6,194,183		Markvardsen et al.	02-27-2001	
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<b>FOREIGN PATENT DOCUMENTS</b>								44
Exami ner Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Office	Number	Kind Code (if known)				
	42	EP	0 125 228	A1	President and Fellows of Harvard College	06-15-1988		

Examiner Signature	<i>Shin-Lin chen</i>	Date Considered	<i>8-21-02</i>
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INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(use as many sheets as necessary)

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43	EP	0 725081	A1	Kyowa Hakko Kogyo Co., Ltd.	08-07-1996		
44	EP	0876509	B1	Maxygen, Inc.	09-19-2001		
45	EP	0911396	A2	Stemmer	04-28-1999		
46	EP	0911396	A3	Stemmer et al.	05-06-1999		
47	EP	0934999	A1	Stemmer et al.	08-11-1999		
48	WO	90/14443		Huse	11-29-1990		
49	WO	91/07979		Center for Innovative Technology	06-13-1991		
50	WO	92/03461		Ixsys, Inc.	03-05-1992		
51	WO	92/06204		Ixsys, Inc.	04-16-1992		
52	WO	92/11272		Ixsys, Inc.	07-09-1992		
53	WO	93/06214		The United States of America	04-01-1993		
54	WO	93/10214		Georgiou	05-27-1993		
55	WO	94/06421		The University of Tennessee Research	03-31-1994		
56	WO	94/23738	A1	Medisorb Technologies International L.P.	10-27-1994		
57	WO	94/26787	A1	The Board of Trustees of the Leland Stanford Junior University	11-24-1994		
58	WO	95/16027	A1	Borrebaeck	06-15-1995		
59	WO	96/11279	A1	US Department of Health and Human Services	04-18-1996		

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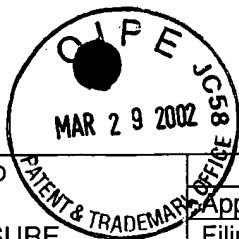
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Shin-Lin Chen

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8-28-02

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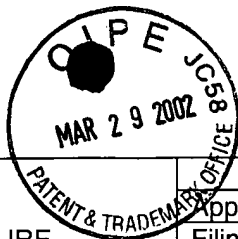


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61	WO	96/37624		MG-PMC, L.L.C.	11-28-1996		
62	WO	97/04077		Recombinant Biocatalysis, Inc.	02-06-1997		
63	WO	97/07128	A1	Duke University	02-27-1997		
64	WO	97/07205		Okkels	02-27-1997		
65	WO	97/11605	A1	University of Pittsburg of the Commonwealth System of Higher Education	04-03-1997		
66	WO	97/25410		Borchert et al	07-17-1997		
67	WO	97/32987	A1	University of Toronto	09-12-1997		
68	WO	97/44361		Lam et al.	11-27-1997		
69	WO	97/48416		Mathur et al.	12-24-1997		
70	WO	97/48717		Short et al.	12-24-1997		
71	WO	97/48794		Murphy et al.	12-24-1997		
72	WO	98/00526		Robertson et al.	01-08-1998		
73	WO	98/01581		Short	01-15-1998		
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77	WO	98/28416		Bjornvad et al.	07-02-1998		
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80	WO	98/41623		Borchert et al.	09-24-1998		
81	WO	98/41653		Vind et al.	09-24-1998		

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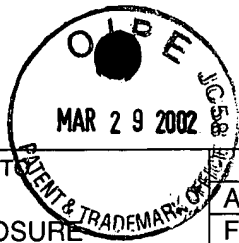


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83	WO	98/42832	Arnold et al.	10-01-1998	
84	WO	98/45444	The Regents of the University of California	10-15-1998	
85	WO	98/48034	Neiboer et al.	10-29-1998	
86	WO	98/49286	Board of Regents, The University of Texas System	11-05-1998	
87	WO	98/58085	Short et al.	12-23-1998	
88	WO	99/07837	Callen	02-18-1999	
89	WO	99/08539	Kretz	02-25-1999	
90	WO	99/10472	Short	03-04-1999	
91	WO	99/10539	Short	03-04-1999	
92	WO	99/19506	Ixsys, Inc.	04-22-1999	
93	WO	99/19518	Short	04-22-1999	
94	WO	99/21979	Apt et al.	05-06-1999	
95	WO	99/23107	Stemmer et al.	05-14-1999	
96	WO	99/23236	Diversa Corp. et al.	05-14-1999	
97	WO	99/29902	Arnold et al.	06-17-1999	
98	WO	99/41366	The Board of Trustees of the Leland Stanford Junior University	08-19-1999	
99	WO	99/41368	Maxygen, Inc.	08-19-1999	
100	WO	99/41369	Maxygen, Inc.	08-19-1999	
101	WO	99/41383	Maxygen, Inc.	08-19-1999	
102	WO	99/41402	Maxygen, Inc.	08-19-1999	

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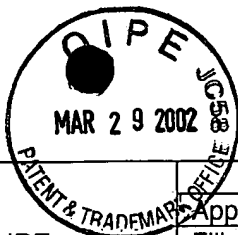
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	104	WO	99/57128		Stemmer et al.	11-11-1999		
	105	WO	99/65927		Maxygen, Inc,	12-23-1999		
	106	WO	00/16984		Polard Corporation	03-30-2000		
	107	WO	00/18778		Phylos, Inc.	04-06-2000		
	108	WO	00/42560		Selifonov et al.	07-20-2000		
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	110	WO	00/46344		Diversa Corporation	08-10-2000		
	111	WO	00/53744		Short et al.	09-14-2000		
	112	WO	00/58517		Short et al.	10-05-2000		
4u	113	WO	01/00234		Maxygen, Inc	01-04-2001		

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OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS				
Exami ner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		
4u	114	Affholter et al. (1998) "Directed evolution of proteins and pathways by DNA shuffling." Book of Abstracts, 216th ACS National Meeting, Boston, August 23-27, BIOT-042		
	115	Agren et al. (1997) "Genetically Engineered Nontoxic Vaccine Adjuvant That Combines B Cell Targeting with Immunomodulation by Cholera Toxin A1 Subunit." <i>J. Immunol</i> 158:3936		
	116	Ahmed (1995) <i>J Bacteriology</i> 177(14):3904-3910		
	117	Ahn et al. (1996) "Human cytomegalovirus inhibits antigen presentation by a sequential multistep process." <i>Proc. Natl. Acad. Sci USA</i> 93:10990		
	118	Aizaki et al. (1998) "Full-Length Complementary DNA of Hepatitis C Virus Genome From an Infectious Blood Sample." <i>Hepatology</i> 27:621-627 (1998)		
	119	Aldovini & Young (1991) "Humoral and cell-mediated immune response to live recombinant BCG-HIV vaccines." <i>Nature</i> 351:479-482		
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121	<b>Appel and Harris</b> (1998) "Antibody titers in domestic ferret kits and kits to canine distemper virus vaccines." <i>JAVMA</i> 193:332-333
122	<b>Atkins et al.</b> (1996) "Manipulation of the Semliki Forest Virus Genome and Its Potential for Vaccine Construction." <i>Mol Biotechnol</i> 5:33-38
123	<b>Axon</b> (1998) "Treatment of <i>Helicobacter pylori</i> : future therapeutic and prophylactic perspectives." <i>Gut</i> 43(1):S70-3
124	<b>Baba et al.</b> , "Identification of CCR6, the Specific Receptor for a Novel Lymphocyte-directed CC Chemokine LARC," <i>The J. of Biolog. Chem.</i> 272 (23): 14893-14898 (1997).
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127	<b>Behrens et al.</b> (1996) "Identification and properties of the RNA-dependent RNA polymerase of hepatitis C virus." <i>EMBO J.</i> 15:12-22
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129	<b>Berkhout et al.</b> (1999) "Genetic Instability of Live, Attenuated Human Immunodeficiency Virus Type 1 Vaccine Strains." <i>J. Virology</i> 73(2):1138-1145
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133	<b>Blachere et al.</b> , "Heat Shock Protein-Peptide Complexes, Reconstituted In Vitro, Elicit Peptide-specific Cytotoxic T Lymphocyte Response and Tumor Immunity," <i>J. Exp. Med.</i> 186:1315-22 (1997)
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135	<b>Blaser</b> (1998) " <i>Helicobacter pylori</i> and gastric disease." <i>BMJ</i> 316:1507-1510
136	<b>Bloom et al.</b> (1993) Characterization of Chimeric Full-Length Molecular Clones of Aleutian Mink Disease Parvovirus (ADV) ... <i>J. Virol</i> 67(10):5976-5988
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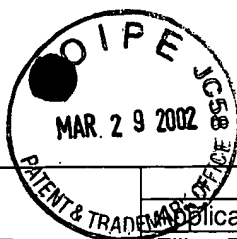
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		basic protein." <i>Nature</i> 379:343-346	
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	150	Carter, "Site-directed mutagenesis," <i>Biochem. J.</i> 237:1-7 (1986)	
	151	Casal (1999) "Use of parvovirus-like particles for vaccination and induction of multiple immune response." <i>Biotechnol Appl. Biochem</i> 29:-141-150	
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	153	Chang, C., et al. (1999) "Evolution of a cytokine using DNA family shuffling." <i>Nature Biotechnology</i> 17:793-797.	
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	159	Coco et al., (2001) "DNA shuffling method for generating highly recombined genes and evolved enzymes" <i>Nature Biotechnology</i> vol. 19 pp. 354-359	
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	161	Conry et al. (1996) "Selected strategies to augment polynucleotide immunization." <i>Gene Therapy</i> 3(1):67-74	
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4/14	163	Crabtree (1998) "Eradication of chronic Helicobacter pylori infection by therapeutic vaccination." <i>Gut</i> 43:7-8	

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Substitute for form 1449A-B/PTO  INFORMATION DISCLOSURE STATEMENT BY APPLICANT  (use as many sheets as necessary)	Complete if Known	
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	First Named Inventor	Juha Punnonen
	Group Art Unit	1633
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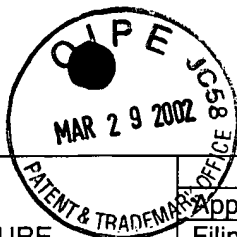


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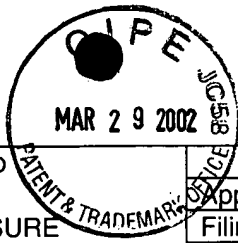


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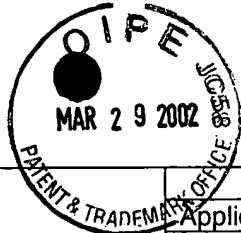


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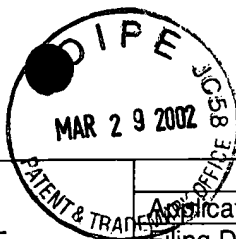
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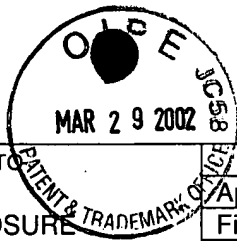
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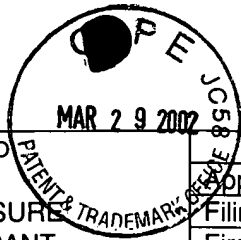


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Attorney Docket No.: 18097-030200US

Application No.: 09/247,886

LIST OF PATENTS AND PUBLICATIONS FOR  
APPLICANT'S INFORMATION DISCLOSURE  
STATEMENT (Use several sheets if necessary)

Applicant: Punnonen et al.

Filing Date: February 10, 1999

Class: 1632

Reference Designation

## U.S. PATENT DOCUMENTS

Page 1

Examiner Initial	Document No.	Date	Name	Class	Sub-class	Filing Date (If Appropriate)
<u>4u</u> AA	5,939,250	08/17/99	Short			
<u>4u</u> AB	5,605,793	2/25/97	Stemmer, et al.			
<u>4u</u> AC	5,834,252	11/10/98	Stemmer, et al.			
<u>4u</u> AD	5,830,721	11/03/98	Stemmer, et al.			
<u>4u</u> AE	5,811,238	09/22/98	Stemmer, et al.			
<u>4u</u> AF	5,928,905	07/27/99	Stemmer, et al.			

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## FOREIGN PATENT DOCUMENTS

	Document No.	Date	Country	Class	Sub-class	Translation (Yes/No)
<u>4u</u> AG	WO 97/20078	5 June 97	PCT			
<u>4u</u> AH	WO 94/25608	10 Nov. 94	PCT			
<u>4u</u> AI	WO 97/35957	2 Oct. 97	PCT			
<u>4u</u> AJ	WO 96/23882	8 Aug. 96	PCT			
<u>4u</u> AK	WO 95/26718	12 Oct. 95	PCT			
<u>4u</u> AL	WO98/27230	25 June 98	PCT			
<u>4u</u> AM	WO 95/22625	24 Aug. 95	PCT			
<u>4u</u> AN	WO 96/33207	24 Oct. 96	PCT			
<u>4u</u> AO	WO 98/13487	2 April 98	PCT			

## OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

<u>4u</u> AP	Attridge et al., "Oral delivery of foreign antigens by attenuated Salmonella: consequences of prior exposure to the vector strain," <i>Vaccine</i> 15(2): 155-162 (1997).
<u>4u</u> AQ	Choate and Khavari, "Sustainability of Keratinocyte Gene Transfer and Cell Survival in vivo," <i>Human Gene Ther.</i> 8: 895-901 (1997).
<u>4u</u> AR	Christians, F.C. et al., "Directed evolution of thymidine kinase for AZT phosphorylation using DNA family shuffling," <i>Nature Biotechnology</i> 17:259-264 (1999)
<u>4u</u> AS	Courvalin, et al., "Gene transfer from bacteria to mammalian cells," <i>C.R. Acad. Sci. III</i> 18: 1207-12 (1995).
<u>4u</u> AT	Crameri, A. et al., "Combinatorial Multiple Cassette Mutagenesis Creates All the Permutations of Mutant and Wild-Type Sequences," <i>Biotechniques</i> 18:194-195 (1995)
<u>4u</u> AU	Crameri, A. et al., "Construction and evolution of antibody-phage libraries by DNA shuffling," <i>Nature Medicine</i> 2:100-103 (1996)
<u>4u</u> AV	Crameri, A. et al., "DNA Shuffling of a family of genes from diverse species accelerates directed evolution," <i>Nature</i> 391:288-291 (1998)
<u>4u</u> AW	Crameri, A. et al., "Improved Green Fluorescent Protein by Molecular Evolution Using DNA Shuffling," <i>Nature Biotechnology</i> 14:315-319 (1996)
<u>4u</u> AX	Crameri, A. et al., "Molecular evolution of an arsenate detoxification pathway by DNA shuffling," <i>Nature Biotechnology</i> 15:436-438 (1997)
<u>4u</u> AY	Deng, H., et al., "Sustainable cutaneous gene delivery," <i>Nature Biotechnol.</i> 15: 1388-1391 (1997).
<u>4u</u> AZ	Fox, M.E., et al. "Anaerobic bacteria as a delivery system for cancer gene therapy: in vitro activation of 5-fluorocytosine by genetically engineered clostridia," <i>Gene Ther.</i> 3: 173-178 (1996).
<u>4u</u> BA	Fritz, J.D., "Gene Transfer into Mammalian Cells Using Histone-Condensed Plasmid DNA," <i>Human Gene Therapy</i> 7: 1395-1404 (1996).

FORM PTO-1449 (Modified)

Attorney Docket No.: 18097-030200US

Application No.: 09/247,886

LIST OF PATENTS AND PUBLICATIONS FOR  
APPLICANT'S INFORMATION DISCLOSURE  
STATEMENT (Use several sheets if necessary)

Applicant: Sunnonen et al.

Filing Date: February 10, 1999

Group: 1632

<u>41</u> BB	Gates, C.M. <i>et al.</i> , "Affinity Selective Isolation of Ligands from Peptide Libraries Through Display on a <i>lac</i> Repressor 'Headpiece Dimer'" <i>J. Mol. Biol.</i> 255:1-14 (1995)
BC	Hilgers, A.R., <i>et al.</i> , "Caco-2 Cell Monolayers as a Model for Drug Transport Across the Intestinal Mucosa," <i>Pharmaceutical Res.</i> 7(9): 902-910 (1990).
BD	Khavari and Krueger, "Cutaneous Gene Therapy," <i>Adv. Clin. Res., Dermatologic Clinics</i> , 15(1): 27-35 (1997).
BE	Minshull, J. and Willem P.C. Stemmer, "Protein evolution by molecular breeding," <i>Current Opinion in Chemical Biology</i> 3:284-290 (1999)
BF	Oggoni, M.R. and Pozzi, G., "A host-vector system for heterologous gene expression in <i>Streptococcus gordonii</i> ," <i>Gene</i> 169:85-90 (1996).
BG	Patten, P.A., <i>et al.</i> , "Applications of DNA Shuffling to Pharmaceuticals and Vaccines," <i>Current Op. in Biotech.</i> 8: 724-733 (1997).
BH	Pisetsky, D.S., "Immune Activation by Bacterial DNA: A New Genetic Code," <i>Immunity</i> 5: 303-310 (1996).
BI	Sizemore, <i>et al.</i> , "Attenuated <i>Shigella</i> as a DNA Delivery Vehicle for DNA-Mediated Immunization," <i>Science</i> 270:299-302 (1995)
BJ	Stemmer, W.P.C. and N.W. Soong, "Molecular breeding of viruses for targeting and other clinical properties," <i>Tumor Targeting</i> 4:1-4 (1999)
BK	Stemmer, W.P.C. <i>et al.</i> , "Single-step assembly of a gene and entire plasmid from large numbers of oligodeoxyribonucleotides," <i>Gene</i> 164:49-53 (1995)
BL	Stemmer, W.P.C., "DNA shuffling by random fragmentation and reassembly: <i>In vitro</i> recombination for molecular evolution," <i>Proc. Natl. Acad. Sci. USA</i> 91:10747-10751 (1994)
BM	Stemmer, W.P.C., "Rapid evolution of a protein <i>in vitro</i> by DNA shuffling," <i>Nature</i> 370:389-391 (1994)
BN	Stemmer, W.P.C., "Searching Sequence Space," <i>Biotechnology</i> 13:549-553 (1995)
BO	Stemmer, W.P.C., "Sexual PCR and Assembly PCR," <i>The Encyclopedia of Molecular Biology</i> , VCH Publishers, New York pp. 447-457 (1996)
BP	Stemmer, W.P.C., "The Evolution of Molecular Computation," <i>Science</i> 270:1510 (1995)
<u>54</u> BQ	Zhang, J. <i>et al.</i> , "Directed evolution of a fucosidase from a galactosidase by DNA shuffling and screening," <i>Proc. Natl. Acad. Sci. USA</i> 94:4504-4509 (1997)
EXAMINER	Shin-Lin Chen
DATE CONSIDERED	8-29-02

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

